

BITS

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FEBRUARY 1997

COMPUTING, INFORMATION, AND COMMUNICATIONS (CIC) DIVISION • LOS ALAMOS NATIONAL LABORATORY

The Accelerated Strategic Computing Initiative (ASCI) of the Department of Energy (DOE) is designed to accelerate the development of high-performance computing far beyond what might be achieved without a focused initiative. ASCI is a critical element of Science-Based Stockpile Stewardship. It will provide advanced computational capabilities to meet the future needs of stockpile stewardship and management. ASCI's vision is to shift promptly from nuclear test-based methods to computation-based methods. The problems that ASCI will solve span the activities and responsibilities of three national laboratories: Los Alamos, Lawrence Livermore, and Sandia. These laboratories work jointly with DOE to plan and execute ASCI. ASCI will create the leading-edge computational modeling and simulation capabilities that are essential for maintaining the safety, reliability, and performance of the U.S. nuclear stockpile and reducing the nuclear danger.



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Integrated Computing Network (ICN)

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Centralized scientific and engineering computingconsult@lanl.gov or 7-5746

Lab-wide administrative and business systems.....labwide@lanl.gov or 7-9444

Passwords (required for access to ICN)validate@lanl.gov or 5-1805

Central Computing Facility (CCF)7-4584

Advanced Computing Laboratory (ACL)5-4530

Desktop Support Center (DSC)7-4357 (7-HELP)

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The Accelerated Strategic Computing Initiative (ASCI)

Ushering in a New Era

On August 11, 1995, President Clinton announced the United States' intention to pursue a "zero yield" Comprehensive Test Ban Treaty and thus reduce the nuclear danger. This decision ushered in a new era in the way the U.S. ensures confidence in the safety, performance, and reliability of its nuclear stockpile. The President also reaffirmed the U.S. decision to halt the design of new nuclear weapons. This decision means that the U.S. nuclear weapon stockpile will need to be maintained far beyond its design lifetime.

The Accelerated Strategic Computing Initiative (ASCI) is a critical element needed to shift from test-based confidence to science-based confidence. Specifically, ASCI will accelerate the development of simulation capabilities needed to ensure confidence in the nuclear stockpile—far exceeding what might have been achieved in the absence of a focused initiative.

The ASCI Vision: Shift Promptly from Nuclear Test-Based Methods to Computation-Based Methods.

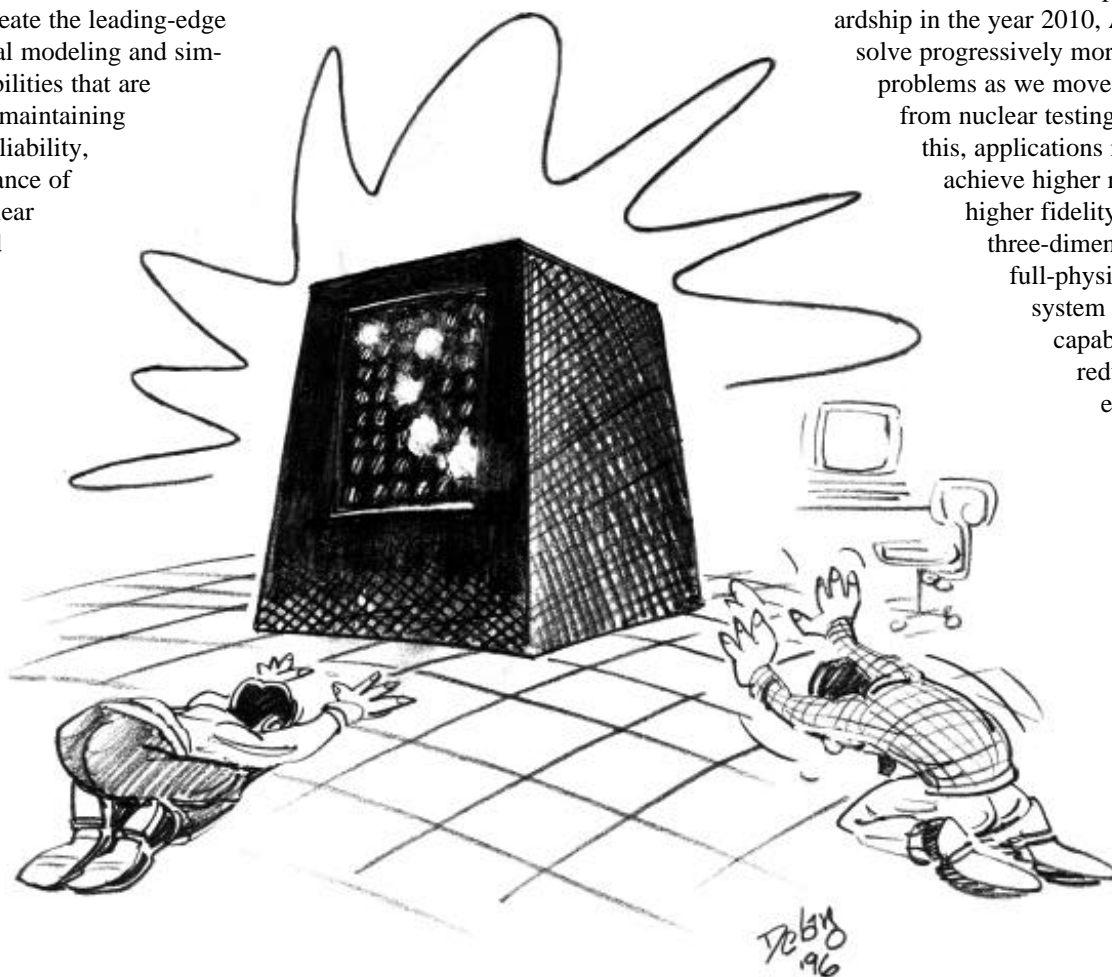
ASCI will create the leading-edge computational modeling and simulation capabilities that are essential for maintaining the safety, reliability, and performance of the U.S. nuclear stockpile and reducing the nuclear danger.

Realizing the Vision

To realize its vision, ASCI will create virtual testing and prototyping capabilities based on advanced weapon codes and high-performance computing. Virtual testing is the use of predictive simulations, based on experimental data, to assess and certify the safety, performance, and reliability of nuclear systems. Today, virtual testing and prototyping exist in rudimentary forms. Dramatic advances in computer technology have made virtual testing and prototyping viable alternatives to traditional nuclear and nonnuclear test-based methods.

ASCI will provide computational and simulation capabilities that will help scientists understand aging weapons, predict when components will have to be replaced, and evaluate the implications of changes in materials and fabrication processes to the design life of the aging weapon systems. This science-based understanding is essential to ensure that changes brought about through aging or remanufacturing will not adversely affect the enduring stockpile.

To meet the needs of stockpile stewardship in the year 2010, ASCI must solve progressively more difficult problems as we move away from nuclear testing. To do this, applications must achieve higher resolution, higher fidelity, and three-dimensional, full-physics, full-system modeling capabilities to reduce empiricism.



This level of simulation requires high-performance computing far beyond our current level of performance. A powerful problem-solving environment must also be established to support application development and enable efficient and productive use of the new computing systems.

The ASCI program recognizes that the creation of simulation capabilities needed for virtual testing and prototyping is a significant challenge. This challenge is on par with many aspects of the original Manhattan Project and requires the science and technology resources available only at the national laboratories. This challenge will require close cooperation with the computer industry to accelerate their business plan to provide the computational platforms needed to support ASCI applications. Universities will also play a critical role in advancing the research and development needed for this unprecedented level of simulation.

Enabling Science-Based Stockpile Stewardship
ASCI is a critical element of the Department of Energy's response to the decision ending nuclear testing by enabling the integration of science into the actual weapons in the stockpile. The Science-Based Stockpile Stewardship (SBSS) program will build on existing means and develop new means to assess the performance of nuclear stockpile systems, predict their safety and reliability, and certify their functionality. The SBSS program not only must respond to the loss of nuclear testing, but also must deal with constraints on nonnuclear testing, the downsizing of production capability, and the cessation of new weapon designs to replace existing weapons. Further complicating matters, weapon components will exceed their design lifetimes, and manufacturing issues and environmental concerns will force changes in fabrication processes and materials of weapon components.

SBSS will support programs responsible for developing the fundamental scientific understanding of nuclear weapons and programs responsible for the surveillance, maintenance, assessment, and certification of the weapons. In the past, much of the integration of the fundamental science development into nuclear weapons was accomplished through testing (specifically, underground nuclear tests). In the future, the simulation capabilities provided by ASCI will provide that integration.

The ASCI Objectives

ASCI has specific program objectives in the areas of performance, safety, reliability, and renewal.

- **Performance:** Create predictive simulations of nuclear weapons systems to analyze behavior and assess performance in an environment without nuclear testing.

- **Safety:** Predict with high certainty the behavior of full weapon systems in complex accident scenarios.

- **Reliability:** Achieve sufficient, validated predictive simulations to extend the lifetime of the stockpile, predict failure mechanisms, and reduce routine maintenance.

- **Renewal:** Use virtual prototyping and modeling to understand how new production processes and material affect performance, safety, reliability, and aging issues. This understanding will help define the right configuration of production and testing facilities necessary for managing the stockpile throughout the next several decades.

These objectives will be realized through the implementation of the five ASCI strategies.

The ASCI Strategies

1. Create Seamless Management: One Program—Three Laboratories

The problems that ASCI will solve for the SBSS program span the activities and responsibilities of the three Defense Programs laboratories: Los Alamos, Sandia, and Lawrence Livermore. Cooperation among these laboratories is essential to solving these problems in an efficient and effective manner. There has been, and will continue to be, unprecedented cooperation among the three laboratories. The ASCI program will be implemented by project leaders at each of the laboratories, guided by the Office of Strategic Computing and Simulation under the Assistant Secretary for Defense Programs. The weapon laboratories will share ASCI code development, computing, storage, and communication resources across laboratory boundaries in joint development efforts.

2. Focus on Advanced Applications Development

The key to reaching the SBSS objectives outlined for 2010 is our ability to achieve in the intervening years ASCI's critical simulation and applications code milestones. ASCI will provide simulations embodying all the physics needed to predict the safety, reliability, performance, and manufacturability of weapon systems.

It is a formidable challenge to replace the empirical factors and adjustable parameters used in the current calculations with predictive physical models. Solving this challenge will require large, complex computer applications codes that drive the scale of computing machinery and the infrastructure.

However, increased capability in machinery and infrastructure alone is insufficient. Much of the increased computational capability to be provided by ASCI must come from advances in the applications codes themselves. These applications will integrate 3-D capability, finer spatial resolution, and more accurate and robust physics. Tightly integrated code teams—large interdisciplinary work groups whose objective is to produce coherent software packages for efficient predictive simulations—will develop these codes.

3. Focus on the High End of Computing

More powerful computers are needed for virtual testing and prototyping applications. ASCI will stimulate the U.S. computing industry to develop high-performance computers with speeds and memory capacities thousands of times greater than currently available models and ten to several hundred times greater than the largest computers likely to result from current development trends. ASCI will partner with various U.S. computer manufacturers to accelerate the development of larger, faster computer systems and software that are required to run Defense Programs applications.

4. Create Problem-Solving Environments

ASCI's unprecedented code development effort will require robust problem-solving computing environments where codes may be developed rapidly. ASCI will develop a computational infrastructure to allow applications to execute efficiently on the ASCI computer platforms and allow accessibility from the weapon designer's desktops. This computational infrastructure will consist of local area networks, wide-area networks, advanced storage facilities, and software development and data visualization tools.

5. Encourage Strategic Alliances and Collaborations

ASCI will require the technical skills of the best scientists and engineers working in the academia, industry, and other government agencies in addition to those working in the national laboratories. The need to develop an unprecedented level of simulation capability requires strategic alliances with leading research organizations. These alliances will support the development and credible demonstration of this simulation capability. ASCI will also work with the larger computing community to develop and apply commercially acceptable standards. Finally, ASCI plans to initiate exchange programs to bring top researchers directly into the project while allowing laboratory personnel to expand their experience base in external projects.

Conclusion

In August 1995, the U.S. took a significant step to reduce the nuclear danger. The decision to pursue a "zero yield" Comprehensive Test Ban Treaty will allow greater control over the proliferation of nuclear weapons and will limit the growth (if not reduce the size) of the nuclear arsenals. This step is only possible because of the SBSS program, which provides an alternative means of ensuring the safety, performance, and reliability of the U.S. enduring stockpile. At the heart of the SBSS program is ASCI, which will create the high confidence simulation capabilities needed to integrate fundamental science, experiments, and archival weapons in the stockpile. ASCI will also serve to drive the development of simulation as a national resource by working closely with the computer industry and universities.

The content for this article was excerpted from the ASCI Program Plan dated July 29, 1996. For more information contact Jeff Brown at (505) 665-4655 or jeffb@lanl.gov.

The ICN Consulting Office

The Integrated Computing Network (ICN) Consulting Office is an icon in CIC division. It was established 25 years ago and continues to serve customers of the ICN and its associated services. The lists of topics routinely addressed by this team vary from the unpacking of e-mail attachments to the best ways to run code on the Crays. The ICN Consulting Office publishes a "Tips from the Consultants" article almost every month in BITS to help guide the scientific computing community. We have established several Web tools, including machine status checkers (secure and open) and tutorials on distributed and mathematical computing. We opened a satellite office in X-division and co-authored the Special BITS issue for new users. We offer classes in beginning UNIX and spearhead the New Mexico Supercomputing Challenge for high school students. In a nutshell, we do it all!

Currently there are five ICN Consultants. Sara Harshman has been with the ICN Consulting Office for 6 years. She is a member of the UNICOS and Network teams in CIC. Jeffrey Johnson joined us in 1994 after working for NIS and X divisions. He is our all around UNIX guru and "Consultant to the World." Jeff is active with the WWW team and NMUG. David Kratzer has been a cornerstone for the ICN consultants since 1984. He is active with the NM Supercomputing Challenge and our resident UNICOS historian. Dale Leschnitzer has been with the office for about 18 months now, moving from LS to CIC. Dale is a standing member of the Cluster Team and the current ICN Consulting Office Team Leader. Ted Spitzmiller has been in

the office since 1989 and is a regular member of our Documentation team. He helped establish the new "Computing at LANL" Web pages and the Special BITS. In March of 1996, we tragically lost Dr. John Wood. John was the ideal consultant and coworker. He was a recipient of the 1996 John Norton award, CIC's highest honor for an employee. His presence is still felt through the numerous utilities and documents he developed, many of which are still being used on a daily basis.

The ICN Consulting Office tries to answer as many questions as possible on the first call. However, this is not always possible and often other experts in various areas are called in to assist. This establishes the ICN Consulting Office as a front door to many of the other resources in CIC.

Some helpful ICN Consulting Web Sites include the following:

Open ICN Machine Status:

<http://consult.lanl.gov/status.html>

Secure ICN Machine Status:

<http://roswell.lanl.gov/cic/status.html> (In the Secure, only.)

Cluster Tutorials (Maple, Mathematica, LSF):

<http://saaz.lanl.gov/tutorials.html>

To reach out and touch an ICN consultant, give us a call at (505) 665-4444 option 3 (Monday-Friday, 8:00 a.m.-5:00 p.m. MST) or e-mail us at consult@lanl.gov.



ICN Consultants (L to R): Ted Spitzmiller, Dale Leschnitzer, Jeffrey Johnson, John Wood, David Kratzer, and Sara Harshman

ICN Consulting services cover the following:

1. Compute Servers:

- Open Crays (Rho, Gamma)
- Secure Crays (Zeta, Sigma, Tau)
- Open Cluster (eight IBM RS/6000 workstations and a two-node IBM SP-2)

2. File Storage Services:

- Common File System (CFS)
- Mercury
- Adstar Distributed Storage Manager (ADSM)

3. Information Services:

- Basic Internet
- World Wide Web
- Electronic Mail Servers

4. Operating Systems:

- UNIX/ULTRIX
- UNICOS
- VMS

5. Languages:

- Fortran 77/90
- C/C++

6. Debuggers:

- Cray debuggers (LDB, TotalView)
- Cluster debuggers (DBX)

7. Typesetting Systems:

- TeX
- LaTeX
- troff

8. Editors:

- vi
- FRED

9. Workstation Software:

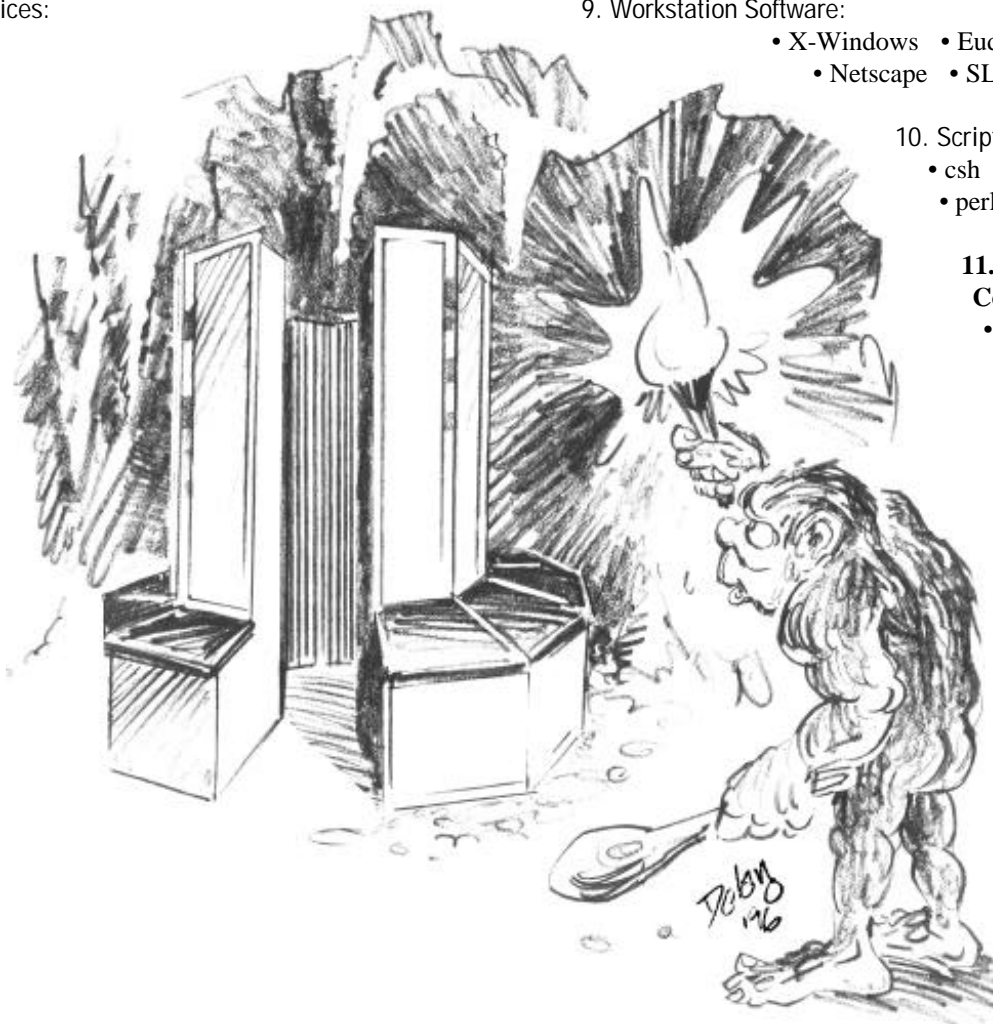
- X-Windows
- Eudora
- Netscape
- SLIP/PPP

10. Scripting Languages:

- csh
- sh
- ksh
- perl

11. UNIX User Commands:

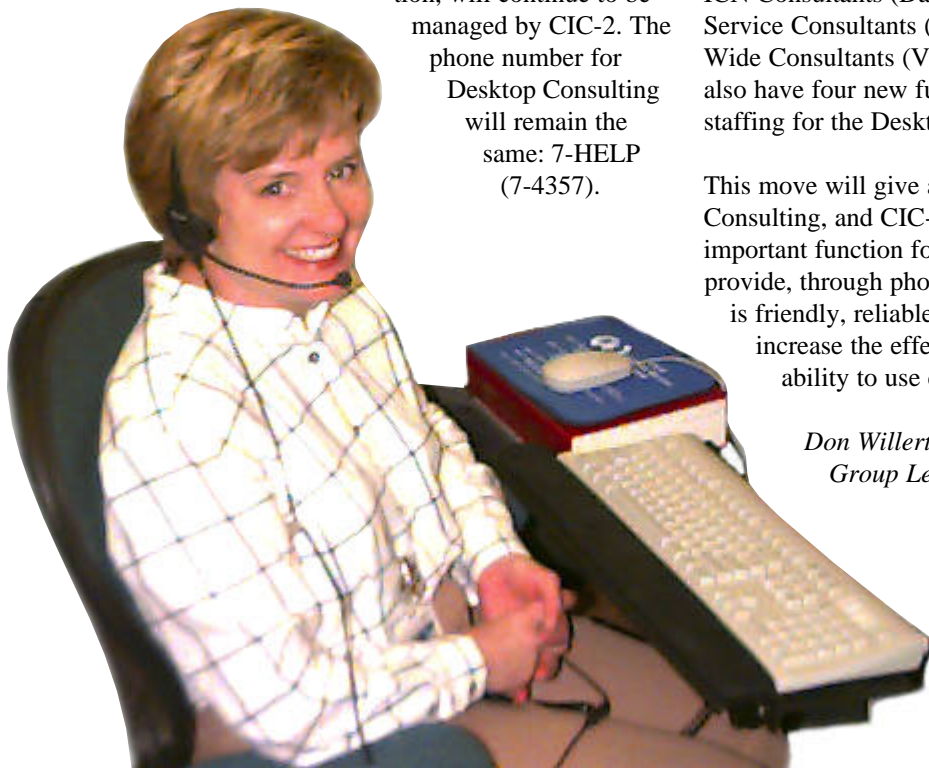
- ls
- sort
- grep
- etc., etc.



*Dale Leschnitzer, consult@lanl.gov, (505) 665-4444 option 3
ICN Consulting Office / Customer Service Group (CIC-6)*

Desktop Consulting Moves to CIC-6

By the end of February, the Customer Service Group (CIC-6) will be performing the Desktop Consulting function, which is currently managed by the Desktop Group (CIC-2). Desktop Consulting covers Macintoshes, PCs, and all their related software and network configurations. Other desktop functions, such as hardware repair, hardware and software purchasing, and desktop administration, will continue to be managed by CIC-2. The phone number for Desktop Consulting will remain the same: 7-HELP (7-4357).



Team leader for Desktop Consulting Diana Tuggle

Desktop Consulting can also be reached through the Customer Service Center at 5-4444.

Bringing the Desktop Consulting function into CIC-6 will allow us to consolidate a large segment of CIC consulting services into one group. Management of Desktop Consulting will be consistent with the other CIC-6 consulting services: ICN Consultants (Dale Leschnitzer, team leader), Customer Service Consultants (Diana Tuggle, team leader), and Lab-Wide Consultants (Vonetta Pompeo, team leader). We will also have four new full-time people to ensure adequate staffing for the Desktop Consulting function.

This move will give a new look and feel to Desktop Consulting, and CIC-6 is pleased to incorporate this very important function for the Laboratory. It is our intention to provide, through phone and e-mail, Desktop Consulting that is friendly, reliable, accurate, and timely. Our goal is to increase the effectiveness of people by enhancing their ability to use computers.

*Don Willerton, dxw@lanl.gov, (505) 665-0424
Group Leader / Customer Service Group (CIC-6)*

Software Discounts Available through Microsoft Select

Microsoft Select is a new software-purchasing program that begins in February. Microsoft Select provides substantial discounts on PC and Mac software, upgrades, and new releases. For details, point your Web browser at "What's New" and "New ESD Software" on the LANL home page.



DOE Energy Science & Technology Database Coverage Expanded

Los Alamos National Laboratory researchers can now access the complete DOE Energy Science & Technology database containing approximately 3.5 million citations directly from their desktops. Until recently the LANL Research Library only provided comprehensive access to citations from 1990 to the present. With the recent addition of all the database back files, comprehensive coverage is provided from 1974 to the present. Citations for earlier years are selectively included with some dating as far back as the early 1700s.

DOE Energy Science and Technology is a multidisciplinary database containing worldwide references to basic and applied scientific and technical research literature, especially energy and its related topics. The scope of the database encompasses all technological aspects of energy production, conversion, and efficient utilization, as well as related economic, social and political aspects. Major topical areas are fossil fuels, renewable energy resources, nuclear energy, fusion energy, energy storage and conversion, end-use technology, advanced energy systems, and energy policy. Coverage also includes aspects of chemistry, engineering, environmental science, biomedical science, physics, mathematics, computer science, materials, and instrumentation related to energy technology.

Citations describe the following types of literature: reports, journals, conferences, patents, books, theses, and software. These citations are provided by the U.S. Department of Energy, its contractors, and other government agencies. Also included is information from the International Energy Agency's Energy Technology Data Exchange (ETDE) and the International Atomic Energy Agency's International Nuclear Information System (INIS). About 50% of the references are from non-U.S. sources.

The search screen should look familiar because it uses the same software as the LANL Research Library's On-line Catalog. A feature of this database that distinguishes it from the commercially-produced CD-ROM and dial-up versions is the real-time availability of resources within the LANL Research Library collections. The DOE Energy Science & Technology database will be updated twice a month effective January 1997. To link to this database, visit the Research Library's Web site at <http://lib-www.lanl.gov> and select "Electronic Databases" and then "DOE Energy Science and Technology Database."

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Research Library (CIC-14)*

BIOSIS Database now Available via CIC-14

The Research Library (CIC-14) has purchased the electronic tapes for BIOSIS (Biological Abstracts). Desktop access will soon be available through the Research Library's on-line system. Until that conversion is complete, BIOSIS is allowing Laboratory staff to access its database via MELVYL. After typing VT100 when prompted for the terminal type, enter the MELVYL search system, and then type BIOSIS or Start Biosis to begin a BIOSIS search.

The MELVYL BIOSIS database includes 4.6 million citations with abstracts from 6,000 international journals, books, and conference proceedings from 1988 to the present.

Subjects covered are biology, biochemistry, biophysics, biomedicine, microbiology, zoology, ecology, botany, and other life sciences.

There is a link to MELVYL on the Research Library's home page (<http://lib-www.lanl.gov>) and on the Electronic Databases page. A basic MELVYL training class is scheduled for February 19 at 11:00 in the Research Library. You can register via e-mail at library@lanl.gov or call 667-5809.

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Research Library (CIC-14)*

The Current State of HTML: Part II

In the last issue of BITS, I began an article by talking about the “dangers” of writing about HTML. True to the spirit of that introduction, here are two updates and two corrections to that article.

- Update: Since the last article, the World Wide Web Consortium (W3C) has approved their HTML 3.2 Reference Specification as a W3C Recommendation (their strongest classification). The IA-5815: Laboratory Standard HTML has been updated accordingly.
- Update: IA-5815 has been revised to (a) distinguish between Laboratory-internal pages and public pages (with the first we can assume a certain level of browser; with the second we can't) and (b) include JavaScript.
- Correction: In the printed version of the last issue, the `<TABLE>` tag's `CELLPADDING` attribute was misspelled. The on-line version is correct (one P, not two).
- Correction: I asserted in the last article that background colors for `<TABLE>` cells were not included in W3C HTML 3.2. In fact, they were mentioned in the November draft of W3C HTML 3.2 but have been removed from the final specification (i.e., what I wrote then wasn't exactly right then, but it's right now, which is an interesting change of pace).

And so, at the risk of once again needing to clarify and update things, here is a discussion of what I didn't get to last time: `` image controls, `<HR>` horizontal rule controls, `<DIV>` document division controls, and a brief introduction to Java `<APPLET>`s and JavaScript `<SCRIPT>`s.

HTML 3.2 Update

As mentioned above, the HTML 3.2 Reference Specification is now a W3C Recommendation. Hence, all references in this article will be to the final specification, REC-html32, instead of the November draft referenced in the previous issue. Another change is that documents conforming to HTML 3.2 should now start with the following line:

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 3.2
Final//EN">
```

Note that “Final” has replaced “Draft” to reflect the ratification of the specification.

As in the last issue's article, unless otherwise noted, all markup discussed in this article meets the tests of IA-5815: Laboratory Standard HTML.

`` Image Controls

One of the most immediately useful areas of the HTML 3.2 specification is improved control over the placement and use of graphical images. In the old HTML 2.0 specification, there were three placement options for the `` tag: `ALIGN=TOP`, `ALIGN=MIDDLE`, and `ALIGN=BOTTOM`. These simply specified whether an image was supposed to align with the top, middle, or bottom of the line of text in which the image was inserted. `ALIGN=TOP`, for example, vertically aligns the top of the image with the top of the text line, which frequently leaves the lower parts of larger images hanging beneath the line.

HTML 3.2 expands on this by adding the `ALIGN=LEFT` and `ALIGN=RIGHT` options. These options “float” the image to the left or right margin of the page, allowing text to wrap around the image (see Figure 1), as opposed to the various `<TABLE>` constructions that keep the image and text in separate margins (see Figure 2).

Other new `` attributes that meet the IA tests include the following:

- `HSPACE=xx` sets the amount of empty space on the left and right side of the image, in pixels.
- `VSPACE=xx` sets the amount of empty space on the top and bottom of the image, in pixels.
- `USEMAP="#xxx"` specifies the `<MAP NAME="#xxx">` to use for client-side image maps (as opposed to the `ISMAP` used for server-side image maps).
- `BORDER=xx` sets the width of the border (typically blue) surrounding the image. (Set `BORDER=0` to eliminate the blue border surrounding `ISMAP` image maps.)

Note that older browsers that do not support the new markup will generally just ignore it. For example, an older browser that encounters `` will usually place the image on the left side of the page, with one line of text beside the image and the remainder beneath the image. Layout is changed in this case, but I have not seen any examples where content was lost.

For further discussion of the older attributes useful for the `` tag, please refer to the following BITS articles:

- “Barnstorming the Web,” June 1996 (`ISMAP`).

When, in the course of human events, it becomes necessary for one people to dissolve the political bonds which have connected them with another, and to assume among the powers of the earth, the separate and equal station to which the laws of nature and of nature's God entitle them, a decent respect to the opinions of mankind requires that they should declare the causes which impel them to the separation.



Figure 1. Results Using `ALIGN=RIGHT`

When, in the course of human events, it becomes necessary for one people to dissolve the political bonds which have connected them with another, and to assume among the powers of the earth, the separate and equal station to which the laws of nature and of nature's God entitle them, a decent respect



Figure 2. Results Using `<TABLE>`

- "Images on the Web: Some Tips," August 1996 (WIDTH, HEIGHT).
- "Images on the Web: More Tips," September 1996 (WIDTH, HEIGHT).

`<HR>` Horizontal Rule Controls

HTML 3.2 ratifies a number of the horizontal rule (line) controls that have been introduced as vendor extensions during the past few years. These can be used to control both the size and the placement of the rule.

- `WIDTH=xx` sets the width of the rule in pixels (e.g., `WIDTH=350`) or as a percentage of the page width (e.g., `WIDTH="75%"`). This defaults to 100%. Inside tables, width percentages are determined from the available width of the current cell (i.e., `CELLPADDING` is subtracted). When setting the width in pixels, you should test the code on various browsers at various resolutions to ensure that the width is acceptable.

- `ALIGN=LEFT`, `ALIGN=CENTER`, and `ALIGN=RIGHT` control the horizontal placement of the rule. The default is `CENTER`. This attribute is, of course, meaningless unless the width has been set to something less than 100%.

- `SIZE=xx` sets the height of the rule in pixels.

- `NOSHADE` renders the rule as a solid color instead of the 3-D shadow used by many browsers.

For all of the above controls, a number of us still have some philosophical problems. (HTML is an instance of SGML, and SGML is meant to define content, not rendering.) At the same time, though, the new `<HR>` attributes do offer far better performance than the image files many resorted to in order to gain more control over the shape and placement of the lines. (Color, however, is not included.)

All of the above attributes are also ignored by older browsers. Browsers that don't recognize the attributes will continue to display `<HR>` as normal (e.g., 100% width, shaded).

`<DIV>` Document Division Controls

In what may potentially become one of the most important advances in HTML, HTML 3.2 enables us to mark document divisions by enclosing them within `<DIV>` `</DIV>`. This holds potential because it allows us to mark up the actual structure of the document (with more control than `H1`, `H2`, etc., offer), which may eventually lead to attributes that let us specify things like the name, level, and keywords for the division (similar to the `<META>` tag in the `<HEAD>` section).

For now, though, the only available attributes that control the alignment of the text and other content within the division are `ALIGN=LEFT` (default), `ALIGN=CENTER`, and `ALIGN=RIGHT`.

`<DIV ALIGN=CENTER>` is basically the same as `<CENTER>` (which is also included in the specification and which also meets the IA tests). In practical terms, however, `<CENTER>` is currently more widely supported and yields more consistent results.

Java `<APPLET>`s and JavaScript `<SCRIPT>`s

The `<APPLET>` tag is included in HTML 3.2 and is supported by a growing number of Java-compatible browsers.

The basic structure of the tag is as follows:

```
<APPLET CODE="appletname" width=xxx height=xxx>
```

```
<PARAM NAME=instance VALUE="xxxxxx">
```

Message for non-Java browsers.

```
</APPLET>
```

The <PARAM> tag is optional and only used if parameters need to be passed to the applet.

From an HTML perspective, the important points about the <APPLET> tag are as follows:

- Any information after <APPLET...> and <PARAM...> but before </APPLET> is ignored by Java-capable browsers but read by non-Java browsers. This enables us to offer an alternate message (or a link to an alternate page) for those browsers.
- The <APPLET> tag belongs within the <BODY> of the document, not the <HEAD>.

I may or may not address Java <APPLET>s in more detail in a later BITS article. There's plenty to talk about, but there are also a lot of very good reference materials already available on the Web.

JavaScript <SCRIPT>s are a bit different. First, the <SCRIPT> tag is not included in the HTML 3.2 specification,

but it has been added to IA-5815: Laboratory Standard HTML as "provisional" markup. Second, the <SCRIPT> should (not must) reside in the <HEAD> section instead of the <BODY>. This will ensure that the script is completely loaded before the page is displayed. Also, because the script itself is placed between <SCRIPT> and </SCRIPT> (as opposed to being called from within the tag like <APPLET> does), everything inside should be surrounded by <!-- and --> comment notations to prevent older browsers from attempting to read it.

I do plan to address JavaScript in more detail in an upcoming issue of BITS. Like Java, JavaScript has a lot of reference materials available on the Web. There are also, however, some common pitfalls and general guidelines that warrant additional attention.

For More Information

For news from the IA Project, including the current status of its HTML guidelines, please visit our home page at <http://www.lanl.gov/projects/ia/> (or look under "What's New" from the Laboratory home page). For other HTML-related resources, see our Internet/WWW subject area page at <http://www.lanl.gov/projects/ia-lanl/areas/int-web/> (access restricted to Laboratory machines). If you would like printed or e-mail copies of any of the IA materials, please contact me via the information given below.



*Tad Lane, tad@lanl.gov, (505) 667-0886
Information Architecture Standards Editor
Communications Arts and Services (CIC-1)*

Common Validation Error Messages and Possible Solutions for Lab-Wide Systems

A common problem among users of Lab-Wide Systems is to receive an error message while trying to log-on to a GUI Lab-Wide System (i.e., Data Warehouse, Travel, Time and Effort, Employee Development, and Purchase Card). The problem usually occurs during the validation process, which results in an error message and a frustrated user. Often the problem can be easily solved by making sure you've entered all the required data. Below are some common error messages and possible solutions.

Error Message #1

Validation problem

500 access denied

Object: w_login

Event: open

The most common reason for this error message, when using a PC, is that the Z# displayed is not the Z# of the person trying to log-on. The system retains the Z# of the last person to log-on to the Lab-Wide System. If this problem occurs, enter your Z# and repeat the log-on procedure.

This error message may also appear when

- the passcode has been entered incorrectly,
- the pin number has been entered incorrectly on the smartcard, or
- the passcode has been entered using the numeric keypad instead of using the number keys on the keyboard.

Error Message #2

Validation problem

500 access denied

principal expired

Object: w_login

Event: Open

This error message indicates that your password has expired. If this error message appears, call the Password Office for assistance (665-1805).

Error Message #3

Validation problem

500 Log on to the "register" service to re-synchronize your smartcard. Object: w-login

Event: Open

A smartcard needs to be re-synchronized if it has not been used for at least two months or if there have been multiple unsuccessful attempts to log-on. If this error message appears, log-on to the Register service to re-synchronize your card or call the Password Office for assistance (665-1805).

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Mathematica Tutorial Available on the Web

We first introduced "Mathematica on the Cluster" back in the August 1995 issue of BITS, which can be accessed from the BITS archives at

<http://www.lanl.gov/Internal/divisions/cic/bits/archive.html>

Mathematica is a popular symbolic arithmetic software package that is available for use on the Open Cluster.

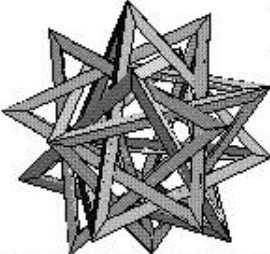
The Cluster Team has released a Web-based tutorial on Mathematica. This tutorial will teach you the fundamentals of Mathematica and will take you through such topics as algebraic expressions and calculus. If you use Mathematica or are considering using a symbolic arithmetic package, please check out the Mathematica Tutorial at

<http://saaz.lanl.gov/math.html>

For Cluster Tutorials on Maple and LSF, check out the Saaz Tutorial at

<http://saaz.lanl.gov/tutorials.html>


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The Cluster Team Presents

A Mathematica Tutorial

- [What is Mathematica?](#)
- [About these pages](#)
- [Mathematica: The Basics](#)
- [Numerical Calculations](#)
- [Graphics](#)
- [Algebra](#)
- [Calculus](#)
- [Differential Equations](#)
- [Vector and Matrix Operations](#)
- [Statistics](#)
- [Programming With Mathematica](#)
- [Mathematica on the Web and Books on Mathematica](#)



Saaz Tutorials

Tutorials on [Maple](#), [Mathematica](#), and [Load Sharing Facility \(LSF\)](#).

This page has been accessed **3259** times since December 2, 1996.

*This page is authored by Wendy Nunnally and Dale H. Leschnitzer.
This page last updated on Monday, December 9, 1996.*

LOS ALAMOS NATIONAL LABORATORY
Operated by the University of California for the U. S. Department of Energy

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Windows 95 SLIP Support Installation

SLIP allows you to dial-up to the LANL Terminal Internet Gateway (TIG) from a remote site using your computer's modem. This article assumes that you already have a modem installed and configured and that you are not connected to any network.

Note: If you have the floppy disk version of Windows 95, you do not have all the files you need. Download the "Dial-Up SLIP and Scripting Support" files from Microsoft to get all the files you will need (<http://www.microsoft.com/windows/software/admintools.htm>).

There are five basic steps to the installation of SLIP/PPP support and scripting in Windows 95. These steps must be done in order.

I. Installation of SLIP Software and SCRIPTING Support

II. Setting Up Properties for SLIP/PPP Connection

III. Network Configuration

IV. SLIP/PPP Connection Configuration

V. Setting Up the TIG Login Script

I. Installation of SLIP Software and SCRIPTING Support

1. Open up the Add/Remove Programs icon in the Control Panel.

2. Open the Windows Setup Tab.

3. Select Have Disk.

4. Select Browse and choose your CD drive letter.

5. Choose \Admin\apptools\dscrip.

6. Highlight the rnaplus.inf file.

7. Select OK until you see Components: SLIP and Scripting for Dial-Up Networking.

8. Check the box and select install.

9. Select OK to return to the control panel.

II. Setting Up Properties for SLIP/PPP Connection

1. Open up the Network icon in the Control Panel.

2. Select Network Properties.

3. Under Configuration, do the following:

a. Click Add and select Client.

b. Click Add and select Microsoft: Client for Microsoft Networks and then select OK.

c. Click Add and select Adapter.

d. Click Add and select Microsoft: Dial up Adapter and then select OK.

e. Click Add and select Protocol.

f. Click Add and select Microsoft: TCP/IP and then select OK.

4. Remove any other Clients, Adapters, and Protocols. They are not needed.

5. Under Primary Network Logon, select Windows Logon.

6. Under File and Print Sharing, make no changes.

III. Network Configuration

1. Highlight Client for Microsoft Networks and select Properties.

2. Under Logon validation, uncheck Logon to Windows NT Domain.

3. Under Network Logon options, Select Quick Logon.

4. Select OK

5. Highlight Dial-Up Adapter and select Properties.

6. Under Driver Type, select Enhanced Mode.

7. Under Bindings, select TCP/IP.

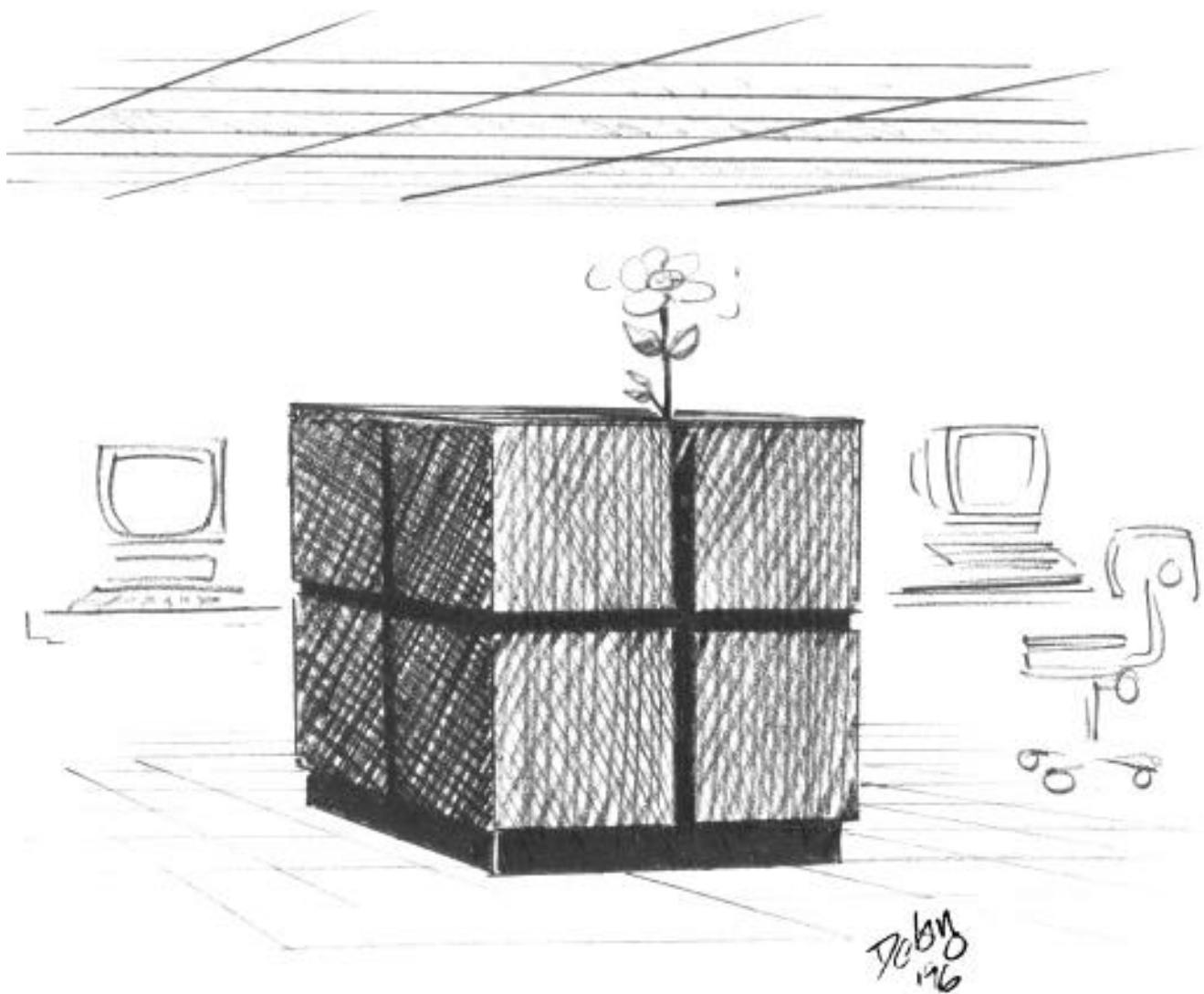
8. Under Advanced, make no changes.

9. Select OK

10. Highlight TCP/IP and select Properties.

11. Under Bindings, select Client for Microsoft Networks.

12. Under WINS Configuration, select Disable.
13. Under IP Address, select IP address automatically.
14. Under DNS Configurations, select Enable DNS.
15. Under Host, enter your System Name (no restrictions).
16. Under Domain, enter "lanl.gov".
17. Under DNS Server Search Order, enter "128.165.4.4" and then select the Add button.
18. Under DNS Server Search Order, enter "192.16.1.2" and then select the Add button.
19. Under Gateway/New Gateway, enter "128.165.7.241" and then select the Add button.
20. Under Advanced, make no changes.
21. Select OK.
22. Select the IDENTIFICATION tab.



23. Under Computer Name, enter any unique name.

24. Under Workgroup, enter your workgroup name. (If you don't know your workgroup name, ask your system administrator.)

25. Under Computer Description, enter a description of your choice.

26. Select the ACCESS CONTROL tab and then select Choose Share-Level Access Control.

27. Select OK. This closes the Network Pop-up. If you are installing for the first time, more files will be copied to your hard drive. Re-boot when prompted.

IV. SLIP/PPP Connection Configuration

1. Go to Dial-Up Networking under Start/Programs/Accessories.

Note: If you don't have an icon for Dial-Up Networking in your accessories, select the start button, choose settings, control panel, Add/Remove Programs. Under the Windows Setup tab, double click Communications Tools and then put a check in the Dial-Up Networking item.

2. Select Make New Connection.

3. Enter a definitive name for the connection (e.g., LANL TIG) and select a modem.

4. Configure your modem now if it has not already been configured.

5. Select Next>.

6. Enter one of the following telephone numbers: 667-9020, 667-9021, 667-9022, 667-9023, 667-9024 or 667-9025. (The area code is not necessary for a local connection.) If you are dialing in from outside of the Los Alamos area, enter 800-443-1461.

7. Select Next>

8. Select Finish. (Your connection will now appear as an icon in the Dial-Up Networking box.)

9. Click on the icon with your right mouse button.

10. Select Properties.

11. Under the General tab, click the configure button. Set the maximum speed of your modem as follows: 38400 for a 14.4 modem and 115200 for a 28.8 modem.

12. Under Connection tab, preferences should be set as follows:

a. Data bits: 8

b. Parity: None

c. Stop bits: 1

13. Click the Advanced button.

Note: If you're using a laptop computer, skip step 14.

14. Check Use Error Control and Compress Data.

15. Check Use flow control and ensure that Hardware (RTS/CTS) is selected.

16. Select OK.

17. Select the Options tab.

18. Check Display Modem Status.

19. Select OK.

20. Click the Server Type button.

21. Under Type of Dial-Up Server, select PPP: Windows 95, Windows NT 3.5, Internet.

Note: If the item "SLIP: UNIX Connection" is not in this list of options, then something went wrong when you performed the first step in these instructions. Go back up to "Installation of SLIP Software and Scripting Support" and repeat those steps. Sometimes it takes two or three tries for this to work properly. You don't want to pick the SLIP option, but it needs to be there for the TIG connection to work.

Note: If you're using a laptop computer, skip step 22.

22. Under Advanced Options, check Enable Software Compression.

23. Under Allowed Network Protocols, ensure that only TCP/IP is checked.

24. Select the TCP/IP Settings button.
25. Select the Server assigned IP address.
26. Select the Server assigned name server address.
27. Check Use IP header compression.
28. Check Use default gateway on remote network.
29. Select OK.
30. Select OK again to exit Server Types.
31. Select OK again to return to Windows 95.

Note: For convenience sake, you may want to “Click-and-Drag” the connection’s icon to your desktop, which will create an easily accessible shortcut to access your connection.

V. Setting Up the TIG Login Script

1. Go to Dial-Up Scripting Tool under Start/Programs/Accessories, which will open up the Dial-Up Scripting Tool window.

Note: You can also download the required script (lanlppp.scp) from the Internet and then save it in the accessories directory (<http://AtomBoy.lanl.gov/tech/internet/slipin95/default.htm>).

2. Create the script by copying it exactly as shown in the next section and then save it as “lanlppp.scp”.

3. Attach your newly created Dial-Up Connection to lanlppp.scp.

4. Double click your connection’s icon to initiate login.

5. Fill in your ICN username and password and then click connect.

Note: For security reasons, you should not check the “remember password” box. If you really need to check this box, talk to your OCSR first.

The LANL Dial-Up Script (lanlppp.scp)

```
;  
; This is a script file that demonstrates how ; to establish a  
PPP connection with LANL ;
```

```
; Main entry point to script
```

```
;  
proc main
```

```
transmit “^M”
```

```
waitfor “Username:”
```

```
transmit $USERID
```

```
transmit “^M”
```

```
waitfor “Password:”
```

```
transmit $PASSWORD
```

```
transmit “^M”
```

```
waitfor “tig>”
```

```
transmit “who^M”
```

```
waitfor “tig>”
```

```
transmit “ppp default^M”
```

```
endproc
```

These instructions may also be found on-line at

<http://AtomBoy.lanl.gov/tech/internet/slipin95/default.htm>

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Desktop Group (CIC-2)

Apple's NeXT OS Plans

There has been considerable confusion and some misinformation concerning Apple's future operating system plans after Apple announced its intention to buy NeXT Software, Inc. Although there are many details yet to be worked out, Apple's main OS strategy is laid out in the white paper, "Apple and NeXT, Combining unparalleled ease of use with industrial-strength performance," which is available on the Web at

<http://macos.apple.com/macros/releases/rhapsody/infosheet.html>

Why NeXT?

When Apple's CEO, Gil Amelio, announced that, with regard to their OS future, Apple was "going with plan A rather than plan B," he made a not-too-subtle reference to Apple's selection of NeXT over the Be operating system. The selection of NeXT came as a surprise to many. But, the bottom line is that Apple believes it can release a working, full-featured operating system faster by using NeXT technology instead of Be technology. The pieces that NeXT has that Be does not are the Macintosh file system support, power management for laptop computers, AppleTalk file-sharing and printing support, and a mature, close to ten year old operating system that is working and bug-free. Apple also got NeXT's programming talent and its impressive Web Objects technology which will help with Apple's Internet strategy.

Like a house built on a weak foundation, continuing with Copland (Mac operating system's former future direction) proved too difficult and too lengthy. Apple needs a "robust OS," one that includes memory protection, preemptive multitasking, multithreading, symmetric multiprocessors, and object-oriented programming (and it needs it soon). These are the pieces that NEXTSTEP and its cross-platform implementation OPENSTEP bring to the table.

Not One but Two Macintosh Operating Systems in the Future

Apple plans to have two versions of their OS: (1) a continuing version of System 7 and (2) the new Rhapsody release,

which is the code name for the NeXT-based OS. (See Figure 1 below.) Apple plans to release updates to their operating system(s) every six months (in January and summer) with maintenance releases in-between. It is important to note that Apple will continue with its current System 7 lineage "for several years." So, there is no reason to worry (for a good while, anyway) about being stuck with an OS that will not run on 68k Macs.

The Rhapsody Premier Release is slated for January 1998, which will only have a limited Macintosh compatibility. (See Figure 2 on page 18.) The Rhapsody Unified Release, with full Macintosh compatibility, is set to be released in mid 1998. The "Advanced Macintosh Look & Feel" will be the new (and improved) GUI interface, which is still to be worked out. This interface will no doubt include the Copland "Personality Manager" that will allow considerable customization by the end user. So, my guess is that if someone wanted to have a "classic Macintosh" GUI front end, something very close to that would be available. Which Microkernel will be used is still to be decided, but it will either be Mach or Solaris based.

There are many hurdles to cross for this OS hybrid. The NeXT OS will need to be ported to the PowerPC, there's the issue of whether to use NeXT's Display PostScript or Apple's

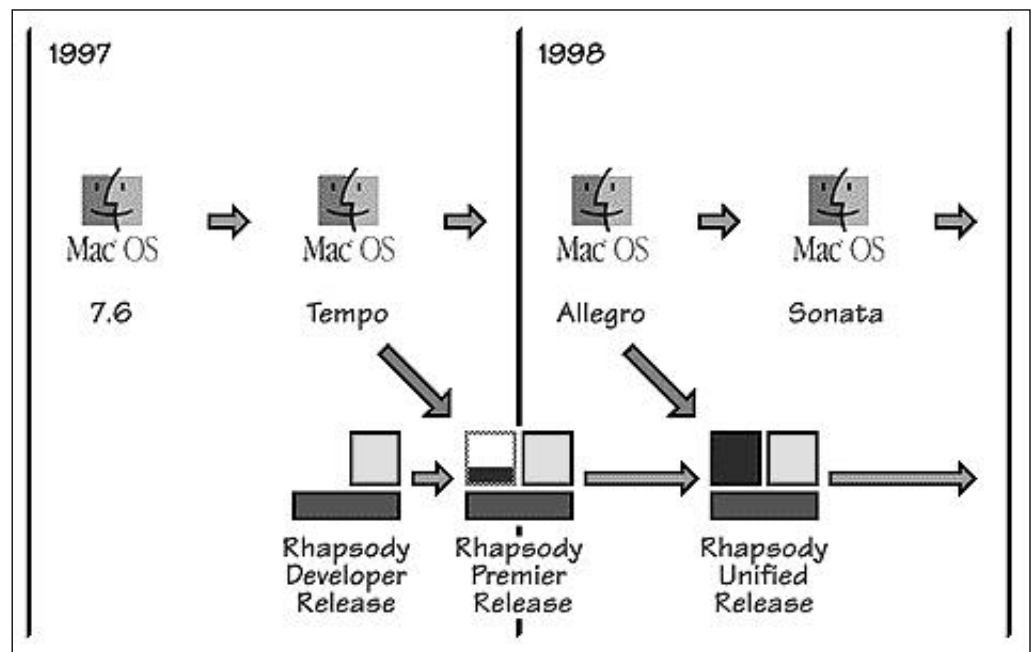


Figure 1. Mac OS Road Map
(Copyright 1997 Apple Computer : Used by permission.)

QuickDraw, much Mac software will need to be rewritten for a multitasking environment, and developers will need to rewrite their software to a new set of APIs. It will be interesting to see how well Apple keeps to their timeline. If there is anything that can be said about developing new operating systems, it's that it always seems to take longer than predicted.

System 7.6 Released

Speaking of operating systems, Apple has just released System 7.6, which has a slew of new features, including an improved Extension Manager, OpenDoc (Apple's component software standard), Cyberdog (an OpenDoc Web "browser"), a new version of Open Transport (that includes PPP support), new printing software, and a new memory manager that translates to better performance. The new QuickTime 2.5 allows, only through the use of software, full screen/full motion QuickTime movies, MPEG video playback, and searching for words embedded within QuickTime movies. There is also a new and improved installer that updates hard disk drivers during set-up as well. System 7.6 will be available from the Lab's Electronic Software Distribution Web page (<http://ns-cic2.lanl.gov/esd/>) by the time this article is printed. For more information about Apple's System 7.6, see

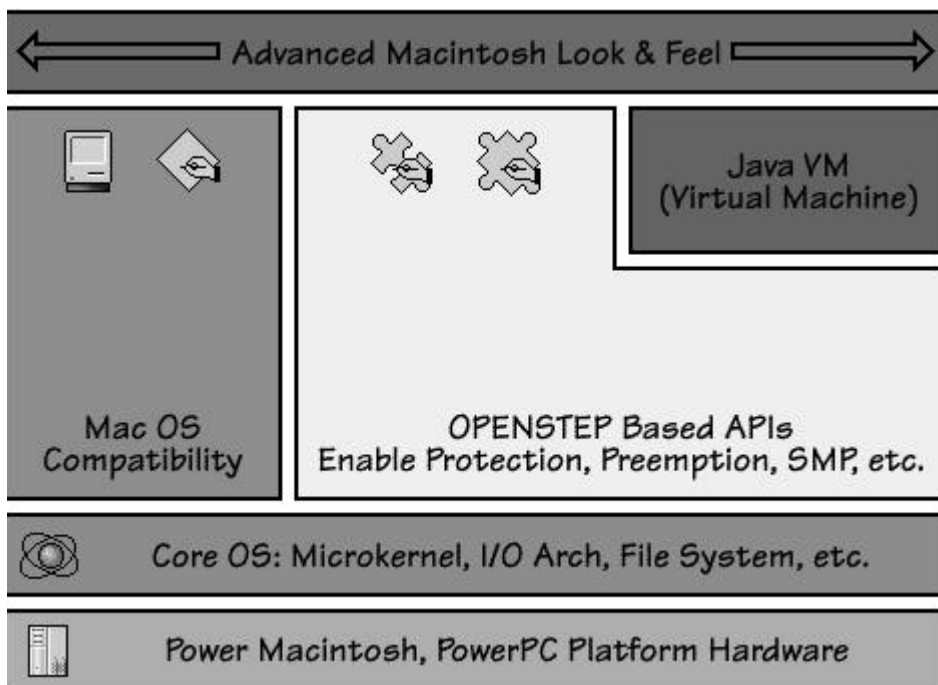
<http://macos.apple.com/macros/releases.html>.

Apple May Be Down but Not Out

The prediction of Apple's demise seems to be a favorite pastime of the press over the years. Yet it is not time to start playing the requiem. Apple still has about \$1.1 billion dollars of cash on hand. Very few corporations in the U.S. (less than 5%) can make that boast. So, Apple can put its nose to the grind stone and work on its new, "industrial-strength" OS with some breathing room. It has even been suggested in a financial article I read that buying Apple stock right now was a good bet.

I feel the final result from all this will be a really good operating system. And one that will be stable for a change. Apple bit the bullet a couple of years ago when faced with the speed limits of the 68000 line of processors and switched to the PowerPC platform. A move that went surprisingly smooth for the work involved and one that most users hardly noticed. Let's hope that Apple can pull this feat off again with their new OS.

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Desktop Group (CIC-2)*



*Figure 2. Mac OS Rhapsody Architectural Diagram
(Copyright 1997 Apple Computer: Used by permission.)*

Research Library Training

The LANL Research Library provides training for using its specialized databases. Training sessions begin and end at times indicated below. Classes are free but you must preregister by calling the Research Desk at 7-5809 or sending e-mail to library@lanl.gov. Special classes and orientations can also be arranged.

Date	Time	Subject Matter
2/4/97	1:00 - 1:30 p.m.	SciSearch at LANL—At your desktop!
2/5/97	1:00 - 1:30 p.m.	Finding Addresses and Phone Numbers on the WWW
2/6/97	1:00 - 1:30 p.m.	Grant and Funding Information
2/6/97	2:00 - 4:00 p.m.	InfoSurfing: Basic Web Searching Strategies
2/11/97	1:00 - 1:30 p.m.	Research Library Catalog via the WWW
2/13/97	1:00 - 1:30 p.m.	SciSearch Alerting Service
2/19/97	11:00 - 11:30 a.m.	MELVYL (U of CA Specialized Databases)
2/20/97	1:00 - 1:30 p.m.	Finding Environmental Information on the WWW
2/20/97	2:00 - 4:00 p.m.	InfoSurfing: Basic Web Searching Strategies
2/25/97	1:00 - 1:30 p.m.	CASSI on CD
2/27/97	1:00 - 1:30 p.m.	Finding CAS Registry Numbers

Lab-Wide Systems Training

The Customer Service Group (CIC-6) offers training for users of Laboratory information systems. The CIC-6 courses offer training for a variety of personnel including property administrators, group secretaries, training coordinators, budget analysts, group leaders, or anyone needing to access training records, property records, costs, employee information, travel, chemical inventories, etc. Refer to the table below and on the following pages for specific information about courses currently offered.

Course Registration

You must have a valid ICN password before taking any of the courses shown in the table. To register for a course, call the CIC-6 Training, Development, and Coordination section at 667-9559 or access our Web page. From the LANL home page, look under "Services/Computing at LANL/Training" or enter the URL:

<http://www.lanl.gov:8010/computer-information/cic6/teampage.html>

Course Title	Date	Time	Cost	Course Number
Employee Development System - Basic Training (EDS I):	2/5/97	8:30 – 12:00	\$350	Course #5289
The course provides hands-on instruction to request course enrollment, use the on-line course catalog, retrieve training transcripts, and assign EDS authorities. The student will learn to create courses, add students to the courses, and generate several training reports.				
Employee Development System - Training Plans (EDS II):	2/19/97	8:30 – 12:00	\$350	Course #7155
Participants receive hands-on instruction to create and maintain training plans, assign assignment codes, and generate training plan reports. Attendees must have prior training in the Employee Development System (course #5289).				
Eudora Electronic Mail	TBA	1:30 – 3:30	\$175	Course #9762
This class is a hands-on class that teaches the participant how to use Eudora software to create, send, receive, and edit electronic mail messages. In addition to these procedures, the participant will learn what related settings mean and how to configure the system to meet his or her individual needs.				
Data Warehouse Basics	2/26/97	1:30 – 3:30	\$175	Course #11961
Students will receive hands-on training to generate standard reports and make quick queries from information in the data warehouse, a real-time collection of data tables from Laboratory financial, time-reporting, and personnel systems.				
Data Warehouse/ Financial Reporting	2/26/97	1:30 – 5:00	\$350	Course #11960
Students will receive hands-on training to generate standard financial reports and make on-line queries from information in the "data warehouse," a collection of data from Laboratory budgeting, accounting, and time-keeping systems.				
HTML Basics	2/20/97	1:30 – 5:00	\$350	Course #11605
Students will gain a basic understanding of HTML (Hypertext Markup Language), the language for the World Wide Web. Topics covered will be commands and standards, creating and editing documents, and authoring programs.				

Course Title	Date	Time	Cost	Course Number
HTML Tables	3/28/97	8:30 – 12:00	\$350	Course #11959
Students gain basic understanding of how to create various tables in HTML and new tags in HTML 3.0. Netscape-specific tags are also identified for clarity. Prerequisite: HTML Basics (Course #11605) or permission of the instructor.				
Introduction to the Internet: Beginning Netscape	TBA	1:30 – 3:30	\$175	Course #10961
Students gain basic understanding of the Internet and the World Wide Web and the use of Netscape as a browser to surf the Net. Topics covered are both Laboratory sites and open sites, along with practical uses of the Internet.				
Lotus Notes 4.0	2/25/97	8:30 – 12:00	\$350	Course #9917
This class provides hands-on instruction for Mac and PC users to use Lotus Notes software to create and send E-mail memos; fax documents; search databases; create filters, nicknames, banners, and doclinks; set defaults; and use multiple address books. In addition, participants learn how to use the memo, meetings, and discussion databases.				
Meeting Maker	2/4/97	1:30 – 4:00	\$175	Course #12395
Students learn how to create an address book, create personal groups, utilize the Auto-Pick feature, utilize e-mail integration with non-Meeting Maker users, and customize various Meeting Maker features.				
On-Line Forms	TBA	3:30 – 5:00	\$175	Course #9756
Participants will learn to use Netscape software to access Lab-wide information and forms. Using Jetform Filler software, participants will access, complete, and print forms such as the "ICN Validation Request," "Visitor Request for Unclassified Visits to Security Areas," and "Request for Quotation."				
Purchase Card System	2/3/97	1:30 – 2:30	\$175	Course #11924
Students will learn to reconcile monthly statement of account, submit reconciled statement of account for approval, print statement of account for audit records, and delegate reconciliation authority. Prerequisite: PCS Overview. Call Ruby O' Rear at 665-4523.				
Reporting with Infomaker	2/6 – 7/97	8:30 – 5:00	\$650	Course #11054
Hands-on training to query data and develop ad hoc, or non-standard, reports from the LANL data warehouse using Infomaker software.				
Time and Effort System (GUI)	TBA	8:30 – 10:00	\$175	Course #11018
The student will learn how to enter attendance, amend attendance, approve attendance, and submit exception and approval reports. Time codes and associated policies will be discussed. The student will also learn how to use the Information Manager utility to view and print reports.				
Travel	2/4/97	8:30 – 11:30	\$350	Course #12091
Hands-on training to submit and approve travel requests and expenses in the new Travel System which replaces the TRIPS on-line system and the post-travel expense worksheets.				

Vendor Computer Training

The Customer Service Group (CIC-6) supports vendor training in technical computing areas such as programming languages, system administration, networking, and World Wide Web development tools. The support provided by CIC-6 can be as limited as providing the appropriate facilities for a specific group or as extensive as coordinating training functions such as system administration, vendor acquisition, EDS administration, and class facilitation. The table below lists classes that are either currently being offered or are available on request. An expanded list of classes that are potentially available can be viewed on the Internet at

<http://www.lanl.gov:8010/computer-information/ComputerTraining/Vendor.html>

To request registration in any vendor course or for general assistance with vendor training, please contact the CIC-Division Vendor Training Coordinator at (505) 667-9399 or send e-mail to cic6-train@lanl.gov.

*Cost per student will vary depending on the total number of students enrolled in the class.

Course Title	Date	Time	Cost	Course Number
C Programming (Beginning)	Available on Request (5 days)		\$1600–\$1900*	3996
Prerequisite(s): An understanding of and useful skills in a high-level programming language. A current ICN password is required. Topics Include: Introduction and Fundamentals; Basic Semantic Constructs - Getting; Base Level I/O With C; The Preprocess-Compilation Environment; Operators, Data Types, and Storage Classes; Control Flow Constructs; Conditional Constructs; Higher-Level Data Constructs in C; File I/O; UNIX Software Tools and POSIX System Calls.				
C Programming (Advanced)	Available on Request (5 days)		\$1600–\$1900*	4777
Prerequisite(s): Useful skills and experience with the C Programming. A current ICN password is required. Topics Include: Data Structures, Algorithms, and OOP; An Advanced Clinic for C ; The ANSI C Recommendation X3.159; C and ANSI C War Stories; The Data Structure and the Assessment of Algorithms; Arrays; Structures; Unions; Stacks; Queues; Linked Lists; Recursive Functions; Binary Trees; Hashing; File Organizations Using the C Runtime Library; Standard Interprocess Communication Mechanisms; and An Introduction and Overview of AT&T's C++ 3.0.				
C++ for Experienced Programmers	Available on Request		\$1600–\$1900*	9050
Prerequisite(s): Excellent C Language programming skills. Topics Include: Major Differences and Additions to ANSI C; Building C++ Classes; Introduction to Text I/O with C++; Function Overloading; Single Inheritance; Virtual Functions; Multiple Inheritance; Operator Overloading; Creating, Initializing and Assigning Objects; Passing and Returning Objects; Templates, Parameterized Functions and Classes; C++Stream I/O with the File System; and C++ Course Summary.				
Java Applications Programming	3/20–21/97	8:30–5:00	\$600 - \$800*	11687
Prerequisite(s): Completion of Beginning Java Programming course or equivalent knowledge. Topics Include: Developing Java Applications; Point-of-Sale Interfaces; Writing Java Code (demonstrating Java security, interactivity, graphics, audio, and animation); Java Class Packages and Subclasses; Memory Allocation and Garbage Collection Work; Interfaces, Exceptions, and Access Modifiers; Multithreading; and Extending Java.				

Course Title	Date	Time	Cost	Course Number
Java Programming (Beginning)	3/17-19/97	8:30-5:00	\$800 - \$1,000*	11686
Prerequisite(s): Students must have the ability to create compiled programs using an advanced language (such as C or C++) and the knowledge to use basic Solaris commands and a World Wide Web browser (such as Mosaic or Netscape). Topics Include: Overview of the Java Programming Language, the HotJava WWW Browser, Applets, Audio and Animation, Importing Java Classes, Attaching Applets to HTML, Object-Oriented Programming Methodology, and Identification of Main Features of Java (including classes, servers, and security).				
Managing Internet Mail: Setting Up and Troubleshooting Sendmail and DNS	Available on Request (3 days)		\$1300-\$1800*	
Prerequisite(s): General knowledge of Unix system and network administration as well as experience with sending and receiving Internet electronic mail. Topics Include: Introduction to Using Electronic Mail; Theory of sendmail Operation; Understanding the sendmail.cf File; Address Rewriting Rules; Debugging sendmail; Understanding the Function of Sub-Domains in a Complex Mail Network; Setting Up Mail Sub-Domains and Mail Routing Hubs; Mail eXchanger (MX) Records and Mail Delivery in the Internet; Setting Up the Domain Naming System; Sendmail 8 - The Next Generation; Automatic Creation of sendmail.cf Files for Sendmail 8; and Verifying and Debugging sendmail.cf Files Generated by the sendmail Compiler.				
Object-Oriented Analysis and Design	Available on Request		\$1200-\$1700*	8981
Prerequisite(s): Familiarity with fundamental programming concepts (data structures, types, control flow selection, iteration, etc.). Prior experience in systems or software analysis and/or development is useful but not required. Topics Include: Introduction to Object-Oriented Technology; The Object Model; OOAD Comparisons; Object-Oriented Analysis and Design I and II; Object-Oriented Analysis and Design Workshop; Object-Oriented Analysis/Design Methodologies; Object-Oriented Tools; Case Study: Texas Instruments; and Management Issues.				
Perl Programming for the WWW	Available on Request (2-3 days)		\$500-\$700/day*	
Prerequisite(s): Programming skills with a light background in Perl and HTML. Topics Include: On-line Resources; Server Configuration; Permissions; Setuid Issues; Tainting; Safe Perl; Data Security; OO Programming; Web Modules; CGI Programs; CGI.pm; What Went Wrong?; CGI Template; Using Forms; Form Template; Input Widgets; Submit Widgets; Reset Widgets; Sample Form; Password Fields; Text areas; Hidden Fields; Checkboxes; Radio Boxes; Popup Menus; Listboxes; Image Maps; Random Links; libwww Modules; Sending Mail; Shopping Carts; Database Access; and Advanced Topics.				
SGI System Administration (Beginning)	Available on Request (5 days)		\$1800-\$2300*	11688
Prerequisite(s): Familiarity with using Silicon Graphics IRIS workstations and system administration procedures on other open system platforms. Topics Include: The Role of the System Administrator; Set Up and Configuration of an IRIS Workstation or Server; Supporting a Group of Silicon Graphics Users; System Security Maintenance; Backups and Recoveries; Configuration of Disk Drives; System Installation and Application Software; Attaching Terminals and Printers; Modifying the system Start Up and Shut Down Sequences; Automating Administrative Procedures; and Performing Basic System Troubleshooting.				

Course Title	Date	Time	Cost	Course Number
SGI Network Administration	Available on Request (5 days)		\$1800-\$2300*	11690
	Prerequisite(s): Completion of Silicon Graphics System Administration (Beginning) course or equivalent knowledge and experience. Topics Include: Networking Fundamentals; Network Configuration; Network Troubleshooting; Resource Management with Network; Information Services; Domain Management with Domain Name System; Electronic Mail with Sendmail; Remote File Sharing with Network File System & Automounter; Network Performance Monitoring; and Network Security.			
SGI System Administration (Advanced)	Available on Request (5 days)		\$1800-\$2300*	11689
	Prerequisite(s): Completion of Silicon Graphics System Administration (Beginning) course or equivalent knowledge and experience. Topics Include: System Error Monitoring; Kernel Reconfiguration and Debugging; System Monitoring Tools; Process Management; MultiProcessor CPU Management; Memory Management and Tuning; Swap Management and Tuning; Disk Management and Tuning; XPS Filesystem Management; and System Security Concepts.			
Solaris 2.X System Administration (Beginning)	Available on Request (5 days)		\$1600-\$2000*	7477
	Prerequisite(s): Knowledge of Unix commands and an editor. Topics include: Custom installation of Solaris2.X server; Add peripheral devices; Use format utility to display partition information; Compress and send binary files; Change system run levels; Add startup files for additional services; Add and remove software packages; Configure terminals and modems; Administer disks and file systems; Discuss basic networking concepts; Configure NFS to support the client-server environment; Use the automounter; Add and remove diskless clients; Back up and restore file systems; Perform basic recovery and troubleshooting procedures; Configure and administer the NIS+ environment.			
Sybase Performance Design and Tuning	Available on Request (5 days)		\$1800-\$2100*	
	Prerequisite(s): One year of Sybase programming or DBA experience OR at least two years of experience with Oracle, Informix, Ingres, or DB2 (no Sybase). Topics Include: Fundamentals of Performance; Designing Sybase Applications for High Performance; Tuning the Sybase Server; and Maintaining and Troubleshooting for Performance.			

INTEGRATED COMPUTING NETWORK (ICN) VALIDATION REQUEST

To access ICN Computing resources, please complete all parts of this form that apply to you, including "Special Requirements."

Mail your completed application to:
ICN Password Office (PWO)
Mail Stop: B271
Los Alamos National Laboratory
Los Alamos, NM 87545

If you have **questions**: Call: (505) 665-1805
E-mail: validate@lanl.gov

All Laboratory computers, computing systems, and their associated communication systems are for official business only. By completing this request, users agree not to misuse the ICN. The Laboratory has the responsibility and authority to periodically audit user files.

Owner Information

Z-Number (if you have one)	PWO Use Only	Name (last, first, middle initial)
LANL Group	LANL Mail Stop	Citizenship (Foreign National see "Special Requirements-Foreign National")
Phone Number	Cost Center	Program Code

Check LANL affiliation: <input type="checkbox"/> LANL employee <input type="checkbox"/> Contractor _____ (specify contract company) <input type="checkbox"/> Consultant, VSM, associate <input type="checkbox"/> External user _____ (specify employer) <input type="checkbox"/> Other (specify) _____	Send password / smartcard to: <input type="checkbox"/> Mail Stop or <input type="checkbox"/> Mail to address indicated below Name / Organization _____ Address _____ City, State, Zip Code _____
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Access

 Check access method and needed partitions:

Access method:	<input type="checkbox"/> ICN Password	<input type="checkbox"/> Smartcard	<input type="checkbox"/> Both
<input type="checkbox"/> Open partition (e.g., email systems, open machines)			
<input type="checkbox"/> Administrative partition (e.g., IA [BUCS, Stores, Travel], IB [EIS, FMIS, PAIRS]) If you are not a Q-cleared LANL employee, see required steps in section "Special Requirements-Administrative Partition," unless you already have Administrative access with an ICN password.			
<input type="checkbox"/> Secure partition (i.e., secure machines) Indicate level(s) of data to be processed: <input type="checkbox"/> Unclassified <input type="checkbox"/> Secret		I certify this person does require secure access: _____ Manager Signature (Group Leader or above) Date	
NOTE: A Q-clearance is required. All classified computing must be performed within the Secure environment.			

PWO Use Only

New <input type="checkbox"/>	Change <input type="checkbox"/>	Clearance Status	Processed	Lv	Smartcard Serial #
Comments:					

Special Requirements

Administrative Partition	
(U.S. Citizens Only)	Lab-Wide Systems (e.g., IA [BUCS, Stores, Travel], IB [EIS, FMIS, PAIRS])
<input type="checkbox"/> Under 18 years of age	If you need to access Administrative systems, your group leader must provide a memo accepting responsibility for your actions and justifying your need for access. This memo is to accompany all forms taken to the security briefing (see "Contractor or Non-Q-Cleared") section below. You may not access the Secure Partition.
<input type="checkbox"/> Contractor or Non-Cleared	Phone (505) 667-9444 to obtain Access Authorization packet. Phone (505) 667-9153 to schedule a security briefing. Bring all forms including this ICN Validation Request to the security briefing for approval.
Security Briefing Approval Signature	Date

<input type="checkbox"/> Foreign National
Attach a copy of Form 982 (REQUEST FOR UNCLASSIFIED VISIT OR ASSIGNMENT BY A FOREIGN NATIONAL) with all approval signatures. Be sure Box #11 of Form 982 is completed. If you are not a visitor/assignee under a LANL/DOE approved Visit / Assignment Request, attach written justification from your host Division Director describing your need to access the ICN.

Authorization (required)

Print Manager Name (Group Leader or above)	Manager Z-Number	Group
Manager Signature (Group Leader or above)	Mail Stop	Date

If you are NOT a LANL employee, obtain your LANL contact's signature in addition to the contact's manager's signature.
NOTE: LANL contacts are regular Laboratory employees. Contacts are responsible for obtaining annual re-authorizations, forwarding renewals, and notifying the ICN Password Office of changes in user or contact status.

Print LANL Contact Name	Contact Z-Number	Phone Number	Group
LANL Contact Signature	Mail Stop	Date	

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